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Keywords

Minoa, Palaikastro, Crete, destruction, cities, earthquake, Theran volcano

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A Look at the Decline and Destruction of a Minoan Town: Palaikastro

Amanda Hardman

Palaikastro, located on the northeastern coast of Crete, had already become an important Minoan city by the end of the Early Minoan Period (EM).¹ Some scholars believe it to have been on par with some of the smaller palatial centers like Gournia and Zakros, and that future excavation will reveal a palace structure like those at Knossos, Phaistos, and Malia (Driessen & MacDonald 1997:228). However, at the end of the Late Minoan IB (LMIB) period it, along with most of the other Minoan sites, suffered a major destruction (Demand 2006:46; Warren 1991:29), resulting in its temporary abandonment (Page 1971:371). Although one of the very few Minoan sites to be re-inhabited in the Late Minoan II (LMII) period by squatters, Palaikastro would never again regain the prominence or splendor it had achieved in the early LMIA period (Driessen & MacDonald 1997:109, 111).

Many scholars (including Warren 1991; Soles and Davaras 1990) believe that “at the moment of destruction...the [Minoan] civilization not only shows no signs of impending collapse but was in fact at its highest level” (Warren 1991:29). More specifically, Warren (1991) argues that Minoan Crete's economic interactions, the unfortified nature of the sites, and the

appearance of open communication across communities indicate the culture was flourishing. For him, the destruction at Palaikastro and other Minoan sites came as a total surprise (Warren 1991:29). However, scholars who share this view have ignored evidence of previous destructions dating to the LMIA period (Driessen & MacDonald 1997:104), as well as those in the MMII and MMIII periods (Warren 1991:35-36). A look at the archaeological remains from Palaikastro suggests a much different picture than the one Warren paints.

This article will argue – in agreement with Driessen and MacDonald (1997) – that an earthquake and the subsequent Theran volcanic eruption in the LMIA period led to a suffering and gradual decline at Palaikastro (and the Minoan culture in general), culminating in the LMIB destruction and temporary abandonment of the site. To do so, evidence for the LMIA destruction at Palaikastro will be examined, including a survey of both the immediate and more long-term effects and the decline of the city. This will then be followed by a discussion of the cause of the LMIB destruction and how it is related to the earlier destruction.

The LMIA Destruction and Its Immediate Effects

Both recent and older excavations at Palaikastro have revealed that it suffered a major earthquake during the LMIA period, as indicated by the LMIA pottery found within the destruction layer (Driessen & MacDonald 1997:15). House B, Blocks Beta (B), Delta (Δ), Gamma (Γ) and Pi (Π), Building 2, Building 3, Building 4, and Building 7 all show unmistakable signs of

¹ Please note that after the introduction abbreviations will be used for the periods discussed in the article, i.e. MMIII = Middle Minoan III period, LMIA = Late Minoan IA period, LMIB = Late Minoan IB period etc. Chronological dates for these periods have not been included or discussed as there is still so much debate within the discipline. Relative chronology will suffice for this discussion. However, it may be helpful to note that the LMIB destruction is thought to have occurred around 1450 B.C. and the LMIA anytime between 1640 and 1550 B.C.

earthquake destruction dating to the LMIA period (Driessen & MacDonald 1997:228). It appears that following this earthquake an effort was made to rebuild the site, as had been done following all the previous volcanic activity in the area (Driessen & MacDonald 1997:33). However, this rebuilding was put on hold following the eruption of the volcano on Thera. The eruption was devastating to the island of Thera, although there is still much debate as to how much of an effect it had on Crete especially when it comes to the severity of the ash-fall on eastern Crete and its effects. Over the next four sections, evidence for the destruction of Palaikastro by the Thera eruption related ash-fall, depletion of ground water, and tsunamis will be analyzed, including an outline of the immediate effects these would have had on the city.

Ash-Fall

Studies done by Vitaliano & Vitaliano (1974:20) in the 1970s on the tephra (volcanic ash) found in the LMIA destruction layers on Crete revealed it to have the same refractive index (~1.509) as the ash on Thera, indicating that the ash on Crete was in fact from the same volcanic eruption as the one on Thera. These findings were reinforced in 2002 when Bruins examined separate tephra deposits (also found in LMIA destruction layers) using geochemical and elemental analysis (Bruins *et al.* 2005:197). However, many differing opinions and estimates have been given for the amount of ash that fell on the islands and many excavations uncovered little or no evidence of volcanic ash (Blong 1978:224; Driessen & MacDonald 1997; Hood 1978:684; Schiering 1978:699). Those estimates based on the position of Crete suggest 30-50 cm (Page 1978:693), while more conservative estimates based on geographical extrapolation from deep sea sediments places the estimate closer to 5-10

cm (Bruins *et al.* 2008:205; Driessen & MacDonald 1997:93). Fortunately at Palaikastro the evidence is more clear. A layer eight centimetres deep of Thera volcanic ash was found outside Building 7, near and inside Building 6 as well as along the coast cliff, mixed with other sediments and ceramic sherds (Bruins *et al.* 2008:196; Driessen & MacDonald 1997:234). What effect did this amount of ash have? Most scholars have argued that there is no way to tell what the effect of poisonous gases, acid rain or scorching winds may have been on the people or animals of Crete (Driessen & MacDonald 1997:90). However, it is possible that the volcanic ash could have seriously affected the fresh water supply. Wells would have been easily muddied and would have needed to be replaced. At Palaikastro there is such evidence: wells going out of use and new ones being built (Driessen & MacDonald 1997:100).

Another possible result of the ash-fall on Crete was climate change (Driessen & Macdonald 1997:92; Gorokhovitch 2005:218). Decline in precipitation, change in water quality, reduced sun radiation, a cooler climate, length of the growing season, and the nature of the crops harvested are all factors which can be expected to have affected the agricultural output of the Minoans at Palaikastro and other areas. In addition, the Thera ash was found to contain high silicate and fluoride which would have changed the soils with a high magnesium content to iron-poor, silica rich soils (Driessen & Macdonald 1997:100). If the Thera eruption happened in the early summer as suggested by prevailing wind directions and by the fact that the *pithoi* in Akrotiri were almost empty (the harvest had not yet been done), the harmful effects on the agriculture of Crete should not be underestimated (Driessen & Macdonald 1997:100). Excavators noted a large increase in the conversion of previous living

space into storage space during the rebuilding of Palaikastro following the LMIA eruption, suggesting that food production and its storage had become of fundamental importance during this period (Driessen & Macdonald 1997:102).

Low rainfall during this time could have allowed ash to cling to vegetation for long periods of time resulting in the destruction of grape, olive, and cereal crops (Driessen & Macdonald 1997:100). Such devastation could have caused a famine in a subsistence agriculture system such as that of the Minoans; however, as already stated above, there are those who feel that the ash from the volcano would have made very little difference on Crete, or that at this time there is not sufficient evidence to make a definite statement (See Blong 1978:224; Hood 1978:684; Schiering 1978:699). However, while future finds may force reconsiderations, based on the current evidence, the conclusions being present here are the most likely to have occurred.

Depletion of Ground Water Supply

Gorokhovich (2005:217) argues that both the earthquake activity before the eruption of Thera as well as continuing seismic activity throughout and after it may have caused a depletion of ground water supply at Minoan sites. Seismic motions and the resulting stress have been shown to be responsible for the increase in the permeability of rock beds, which can lead to the disappearance of streams and a major decline in the water levels of wells (Gorokhovich 2005:219). Evidence of this occurrence may be seen in the closing and relocation of wells in Palaikastro (Driessen & MacDonald 1997:48). It seems possible that following a drop in water levels in the first well, the people of Palaikastro went in search of a different source. However, the depletion of ground water can last for an uncertain period of time, from days to

months, which could have slowed agriculture and as Gorokhovich (2005:219) argues “be interpreted as ‘God’s Wrath’”, with both acting as a stimulus for emigration. At Palaikastro, the population appears to have dropped significantly as indicated by the abandonment of House B, Area 6, and Building 2 in LMIA after the eruption, in addition to the decrease in the level of occupation in the houses still inhabited (Driessen & MacDonald 1997:233).

Tsunamis

Marinatos (1939:435) was the first to suggest that tsunamis caused by the Thera eruption were the cause of the LMIA destruction of eastern coastal Minoan towns, including Palaikastro. However, there was little or no evidence to support his claim until the publication by Bruins *et al.* (2008). Bruins *et al.* (2008) present undeniable proof that the city of Palaikastro was struck by a tsunami in the LMIA period. Finds of imbrication (overlapping) of ceramic sherds, other archaeological and natural components (including cattle bone radiocarbon dated to the LMIA period), chaotic multi-modal geographical deposits, and coralline algae and foraminifera are each definite signs of tsunamis, and could not have been caused by any other water source (i.e. springs, storms, flooding, etc.). Furthermore, storm flooding is a natural process involving multiple waves that would have resulted in numerous discrete layers, instead of the single multi-component layer that was uncovered at Palaikastro (Bruins *et al.* 2008:198). The effects of such an event could have been devastating, not only to architecture but also to the water supply.

As discussed above, the abandonment of one well and building of another could be the result of either ash pollution or depletion of ground water. However, it is also possible that sea water

from the tsunami and the resulting flooding may have polluted the well water. The construction of the enclosure around the well, thought by some to have been erected as protection from human destructions (Driessen & MacDonald 1997:48) may have also served as increased protection against flooding and pollution. In terms of architectural destruction, the tsunami appears to have been what caused the most damage to the houses at Palaikastro, especially Building 2, which appears to have been leveled (Bruins *et al.* 2008:193; Driessen & MacDonald 1997:90). Flooding may have also led to the temporary abandonment of the site. However, for some, the emigration would be permanent, as indicated by both the decreased number of houses as well as rooms within these houses in the following period.

Long-Term Effects and the Decline of Palaikastro

Although much work still needs to be done testing the arguments set out above, Driessen and MacDonald (1997) are correct in asserting that it is clear from the archaeological remains that the city of Palaikastro could never fully recover from the LMIA destruction and consequently underwent a period of decline and stress. This decline is clearly shown in the rebuilding of the city after the LMIA destruction. After the destruction a number of houses were abandoned including House B, Building 2, and Area 6. The level of occupation within the re-inhabited houses also decreased. Both these observations indicate that there was a significant decrease in the population size at Palaikastro during that time (Driessen & MacDonald 1997:42). The houses that were re-occupied underwent some very significant changes in their structure and function after their destruction (Driessen & MacDonald 1997:39). Many areas, which once held a domestic function

before the volcanic destruction were converted into food storage areas (Driessen & MacDonald 1997:52). Moreover, many houses, like X4 (with its olive press) and houses E, B, 2, and 6, (equipped with clay tubes for wine making) became local production centers (Driessen & MacDonald 1997:51). This would suggest that the inhabitants of Palaikastro were in a period of stress and were forced to take subsistence into their own hands. Moreover, it implies that the palatial centers which had once controlled production and food storage were no longer capable and that this “economic aspect of Crete had ceased to be organized solely by the central palatial authorities” (Driessen & MacDonald 1997:101).

The structures that were rebuilt were a pale imitation of their previous selves. Little ashlar masonry was used and stone was scavenged from ruins of neighbouring buildings (Driessen & MacDonald 1997:42-43). Moreover, instead of cleaning up the destruction, doorways were often blocked to hide the ruins. It is clear that at this time few had the means to reproduce the monumental architecture which had characterized the proceeding period (Driessen & MacDonald 1997:42). In addition, previously monumental halls were subdivided into smaller dwellings, which suggests the presence of more than one family dwelling together or squatters, which is usually seen in times of stress and poverty (Driessen & MacDonald 1997:43). This pattern of rather sloppy rebuilding suggests that the city had undergone some negative economic and political changes (Driessen & MacDonald 1997:44), which resulted from the LMIA earthquake and eruption, and which led to the continuing decline of the city until the LMIB destruction.

If the results from Palaikastro are any indication, there seems to have been a trend toward decentralization and regionalism across the entire Minoan

civilization. Administrative functions, as well as food production and storage moved away from the palace centers and into the hands of a new elite, whose presence is indicated by the few isolated attempts to replicate the architectural grandeur of the former period (Driessen & MacDonald 1997:82). However, this does not mean an increase of wealth or importance for the common Minoan. Of the 40 houses excavated at Palaikastro, only eight had any sort of valuables in them (Driessen & MacDonald 1997:228-233). This apparent shift in power appears to have caused the disintegration of the Neopalatial system, and as Driessen and MacDonald (1997:102) argue probably resulted in social strife. It is clear from the archaeological and architectural remains that the Minoan Neopalatial town of Palaikastro did suffer a decline following the LMIA earthquake and volcano related destructions from which it could not recover. In an effort to discover what caused it and how it was related to the previous period of decline, focus will now be shifted to a discussion of the LMIB destruction.

The LMIB Destruction

"This event or events... marks the ruin of a high civilization based on large central buildings (conveniently called palaces), thriving coastal towns and complex rural estates" (Warren 1991:29). Fire appears to have been the main agent in the LMIB destruction - traditionally dated to 1450 B.C. (Hood 1978:681), which affected most of the Bronze Age Minoan sites, especially those in eastern Crete, including Palaikastro (Driessen & MacDonald 1997:106, 108). Marinatos (1939:430) argued that the volcanic eruption was to blame for the LMIB eruptions, citing tsunamis as the cause of the fire.² However,

his argument came to be refuted when it was discovered that Marine style pottery connected with the LMIB period on Crete had not made an appearance on Thera at the time of the eruption, which suggested that the volcano had erupted prior to the Cretan LMIB destruction (Schiering 1978:699). Page (1971:273), still believing that the Thera eruption was to blame for the LMIB destructions, proposed that there must have been two eruptions on Thera, one which deposited the pumice layer and destroyed Thera, and a second eruption which caused the later devastations on Crete. However, the archaeological evidence indicates that the eruption on Thera was of short duration and that the LMIB destruction came later (Hood 1978:683). In recent discourse, earthquake (Schiering 1978:699), outside invasion (Demand 2006; Hood 1971:381; Hood 1978:683), and internal strife (Driessen & MacDonald 1997) have become the three most widely argued causes for the LMIB destruction horizon with no consensus.

The first of the hypotheses, that an earthquake caused the fire destruction at Palaikastro and elsewhere, seems unlikely. Natural disaster cannot be expected to have caused the level nor the wide distribution of damage experienced across eastern Crete (Driessen & MacDonald 1997:108). Instead, human destructive agency remains a more viable alternative. Perhaps the biggest indicator of this at Palaikastro is the evidence that its inhabitants sensed an approaching danger. In the period between the LMIA and LMIB destructions, some areas of the site were rebuilt to restrict access (Driessen & MacDonald 1997:33). Moreover, an enclosure was built around the main fresh water supply (a well), in addition to others perhaps constructed for the

2 Marinatos (1939:435) suggests that the waves must have hit the town at night (or a darkness induced by

the volcanic ash), when lamps, etc., would have been burning, which being disturbed by the water would have cause fire damage.

protection of livestock (Driessen & MacDonald 1997:48). There is also an indication that prior to the LMIB destructions, people were hoarding and hiding valuables. For example, excavations in House C at Palaikastro revealed a niche containing a small hoard of bronze objects, and in rooms 16 and 41 of House X (Chi) small bronze figurines were recovered (Driessen & MacDonald 1997:228). It also appears that only some buildings were targeted for destruction while others left alone. At Palaikastro, while House B was destroyed by fire, a house to the north was spared (Driessen & MacDonald 1997:228). Finally, there is some evidence that the site was plundered at this time, with the looters evidently smashing and then scattering valuables left behind by the previous inhabitants. Examples of this include the pithoi³ in House N (Driessen & MacDonald 1997:109) and the famous Palaikastro chryselephantine *kouros*⁴, which was smashed, snapped and, then “flung” by its destroyer (Bretschneider *et al.* 2007:35).

The question now remains; were Palaikastro and its neighbours destroyed by foreign invaders or internal strife? Demand (2006:42) suggests that the LMIB destruction was the result of the Mycenaeans. Both Demand (2006) and Hood (1978) see the presence of Mycenaeans at Knossos (the introduction of Linear B, Mycenaean style burials and grave goods, etc.) as “in harmony with the view that the horizon of fire-destruction in Crete in the Late Minoan IB reflects a war of conquest” (Hood 1978:683). However, it could be argued that the Mycenaeans came

in later, during the aftermath of the destruction, taking advantage of the severely weakened Minoan state. Warren (1991:36) indicates that it was not until after the final fall of Knossos in the LMIIA2 period that the Mycenaeans gained significant control of the island. At first glance the material remains found within the houses at Palaikastro may appear to indicate that a battle *did* cause the damage. In House X 51-66, a sword and two bronze daggers were found and another bronze dagger or sword in House X-17 (Driessen & MacDonald 1997:228)⁵. However, this number seems too few and isolated to indicate that a major destructive battle was fought here. Moreover, the absence of human victims is also puzzling and does not support this conclusion. It would appear then that internal strife is the most likely candidate for the cause of the LMIB destructions at Palaikastro and elsewhere in eastern Crete. As argued above, the LMIA earthquake and subsequent Theran eruption led to a cultural decline and breakdown. It is not difficult to think that this unraveling may have led to internal stress, resulting in the anarchistic destruction of Cretan towns, cities and palatial centers. It would appear then that it was the period of decline following the LMIA destruction which resulted in social strife (in turn caused by the decentralization of the political system and emergence of a new elite), which led to this LMIB destruction.

Conclusion

The destruction and temporary abandonment of Palaikastro during the LMIB period marked the culmination of a

3 *Pithoi*: (singular pithos) comes from the ancient Greek πιθος, πιθου. The term is used to by archaeologists for the large storage jars which have been uncovered throughout the Mediterranean.

4 *Kouros*: (plural kouroi) comes from the ancient Greek κουρος, κουρου. It is the term used by archaeologists/art historians etc., for statuary representations of male youths.

5 Driessen and MacDonald (1997) also list findings of bronze double-headed axes, however they are associated with Minoan religious cult rather than warfare and have therefore not been included in the discussion of the appearance of weapons in the remains at Palaikastro.

period of decline and increased stress at the site, and was not as some scholars would suggest, a surprising downfall at the time when Minoan civilization had “reached its zenith” (Soles & Davaras 1990:94). The earthquake, tsunami and tephra ash-fall each affected the site of Palaikastro (and its surrounding neighbours) in a negative way, leading to the decline of both the site and the Minoan civilization as a whole. The decline and the stress of the proceeding period appears to have played a key role in the LMIB destruction at Palaikastro.

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